

**ISCHNODEMUS FALICUS (HETEROPTERA: LYGAEIDAE): FIRST RECORD
FROM ORNAMENTAL GRASSES, AND SEASONALITY ON PRAIRIE
CORDGRASS IN PENNSYLVANIA**

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Abstract.—The blissine lygaeid *Ischnodemus falicus* (Say) is recorded for the first time as a pest of an ornamental grass. It infested prairie cordgrass, *Spartina pectinata* 'Aureo-marginata,' in a Pennsylvania nursery, causing foliar chlorosis and occasionally a browning of blade apices. Seasonality of this univoltine bug in the nursery and in a nearby native colony of prairie cordgrass growing along a railroad was similar to that previously reported for Connecticut. Overwintered adults became active in early spring, began to mate by late May, egg hatch occurred by late June, and current-season adults appeared by late August or early September.

Key Words: Insecta, Heteroptera, Lygaeidae, prairie cordgrass, seasonality, Pennsylvania, monophagy

Ischnodemus falicus (Say) is a blissine lygaeid of elongate, dorsoventrally flattened habitus, an adaptation for living in leaf sheaths of grasses (Slater 1976). It has a wide distribution in North America, ranging from Quebec south to North Carolina and Louisiana, and west to South Dakota and Oklahoma (Ashlock and A. Slater 1988). This species has long been known to occur on grasses and sedges growing along ponds and lakes or in brackish areas near salt marshes (Torre-Bueno 1908, Blatchley 1926, Barber 1928). But almost 100 years elapsed from the original description (Say 1832) until a specific host was reported: prairie cordgrass, *Spartina pectinata* Link (Hendrickson 1930). Substantial biological information on *I. falicus* became available only with Harrington's (1972) report on seasonality of a population studied on prairie cordgrass in Connecticut; this bug was absent from nearby colonies of *S. alterniflora* Loisel or *S. patens* (Ait.) Muhl. Her

paper also included incubation time and length of the nymphal stadia determined under laboratory conditions, and information on courtship, gregariousness, and other aspects of its biology.

In September 1989 my attention was called to an infestation of *I. falicus* in a 9-year-old planting of *S. pectinata* 'Aureo-marginata' in a Pennsylvania nursery. Herein I record this lygaeid as a pest of ornamental prairie cordgrass and provide biological notes that allow comparison with the results of field studies in Connecticut (Harrington 1972).

STUDY SITES AND METHODS

Biological observations were made at two sites in Centre Co., Pa.: a nursery (in Halfmoon Twp.) specializing in ornamental grasses, and a nearby small colony of prairie cordgrass growing in ballast along the railroad that parallels Route 220 (Huston Twp., c. 5 km from the nursery). Periodic

collections from one or both plantings were made in 1989 (6 & 21 Sept., 27 Oct.), 1990 (22 Mar., 27 Apr., 7 May, 1 & 21 June, 19 July, 23 Aug., 16 Sept.), 1991 (7 Apr., 20 May, 29 June, 31 July, 5 Oct.), 1993 (29 Sept.) and 1995 (6 & 15 June). On each visit, stems of *S. pectinata* were tapped over a white tray to dislodge the bugs from leaf sheaths. When nymphs were present, a small sample (usually at least 10) was collected, preserved in 70% ethanol, and the stages determined in the laboratory.

RESULTS AND DISCUSSION

Ischnodemus falicus has not previously been accorded economic importance, although this lygaeid has been collected with chinch bugs, *Blissus leucopterus* (Say), on corn (Froeschner 1944). It has also been recorded as a minor household nuisance: swarming about houses during November in North Carolina (Farrier 1958) and congregating on houses along a stream in Connecticut (D. E. Leonard in Harrington 1972). The present paper gives the first record of its occurrence on an ornamental grass.

In August 1989 thousands of nymphs and adults infested prairie cordgrass, aggregating on plants in a row about 45 m long \times 4 m wide and causing foliar chlorosis. Severely infested blades were brown at the tips. When the foliage was parted or the bugs otherwise disturbed, a "buggy" odor was immediately apparent. Similarly a delicate brushing of the grass host of *I. quadrispinosus* Slater in South Africa immediately caused the bugs to emit a "scent odor," suggesting that this lygaeid affords its host some protection from grazing by ungulate herbivores (Slater and Wilcox 1973).

Seasonality of *I. falicus* populations in the nursery and along the railroad right-of-way was similar. Overwintered adults aggregated within leaf sheaths at the base of last season's *S. pectinata* stems that were sprawling on the ground. In early spring, after the row of ornamental prairie cord-

grass had been burned, adults were found at the base of charred stems and in cracks in the soil. Mating pairs (Fig. 1) were observed on new host growth as early as 20 May, but first instars were not seen until late June. During weekly sampling in Connecticut, first instars were not present until the last week of June (Harrington 1972).

By mid-July, only first and second instars were present in the Pennsylvania populations of *I. falicus*. Mating took place as late as mid-July, and first instars could be found until mid-August. At this time, the population consisted mainly of third through fifth instars. Adults of the new generation first appeared in late August to early September. In 1991, no nymphs were observed in early October, but in 1989 they were present in late October. Nymphs apparently do not survive the winter, as noted by Harrington (1972), and only a single generation is produced.

Biological observations on *I. falicus* in Pennsylvania, while not as thorough as those of Harrington (1972) in Connecticut, were similar. This species is a gregarious feeder within leaf sheaths of *S. pectinata*, its principal and apparent sole breeding host. It can be considered a minor pest of *S. pectinata* 'Aureo-marginata,' a cultivar having shiny green leaves and yellow marginal stripes (Ottesen 1989, Still 1994). The bug was common in the nursery each season of observation, despite an annual burning of its host plant in spring. *Ischnodemus falicus* did not infest any of the other ornamental grasses grown in the Pennsylvania nursery, including species of *Arrehenatherum*, *Bouteloua*, *Calamagrostis*, *Deschampsia*, *Elymus*, *Festuca*, *Miscanthus*, *Molinia*, *Panicum*, *Pennisetum*, *Phalaris*, and *Sisyrinchium*.

This lygaeid can be found in native colonies of *S. pectinata* growing under both wet and dry conditions, ranging from salt marshes and freshwater habitats to ballast along railroads. Pure stands of prairie cordgrass once covered large areas of Missouri River bottomland and were present



Fig. 1. Mating pair of *Ischnodemus falicus* on prairie cordgrass.

throughout the tallgrass prairie before the land was placed in agriculture or drained (Brown 1979, DeSelm 1986). Although this plant is stated to occur primarily in swamps and wet prairies and is still found in wetlands within the tallgrass prairie ecosystem (Johnson 1995), its principal habitat in the Midwest is now open dry prairie or high ground along roadsides or railroad rights-of-way (Mobberley 1956, Holder 1990). The bug indeed colonizes prairie cordgrass in such situations in the Midwest. I found adults on this host along the railroad at New Ulm (Nicollet Co.), Minn. (new state record), in June 1995 (see also Holder 1990).

The Pennsylvania occurrence of *I. falicus* in a colony of prairie cordgrass growing in railroad ballast is the first record from such a dry habitat in the East. Previous records have involved either salt- or freshwater habitats. Harrington (1972) commented on the need for a humid immediate environment, noting that eggs and early instars are

particularly vulnerable to desiccation in the field when host grasses become too dry. The prairie cordgrass colony occurring along the railroad in Pennsylvania always maintained a sprawling growth habit, which may have provided the bugs with more moist conditions than an erect or upright-arching growth of the host. The dense nursery planting may have afforded a similar environment.

Blissine lygaeids develop only on monocotyledonous plants, and most species are restricted to one or a few closely related hosts (Slater 1976). *Ischnodemus falicus* appears to develop only on prairie cordgrass. It also is a relatively late-season univoltine bug, whose development in the laboratory from egg to adult requires about two months. In the field, oviposition does not begin until about early June, and current-season adults do not appear until late August or early September.

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LITERATURE CITED

- Ashlock, P. D. and A. Slater. 1988. Family Lygaeidae Schilling, 1829 (=Infericornes Amyot and Serville, 1843; Myodochidae Kirkaldy, 1899; Geocoridae Kirkaldy, 1902): The seed and chinch bugs, pp. 167–245. In Henry, T. J. and R. C. Froeschner, eds., Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, Leiden.
- Barber, H. G. 1928. Order Hemiptera, pp. 74–142. In Leonard, M. D., ed., A List of the Insects of New York with a List of the Spiders and Certain other Allied Groups. Cornell University Agricultural Experiment Station Memoir 101.
- Blatchley, W. S. 1926. Heteroptera or True Bugs of Eastern North America, with Especial Reference to the Faunas of Indiana and Florida. Nature Publishing Co., Indianapolis. 1116 pp.
- Brown, L. 1979. Grasses: An Identification Guide. Houghton Mifflin Co., Boston. 240 pp.
- DeSelm, H. R. 1986. Natural forest openings on uplands of the eastern United States, pp. 366–375. In Kulhavy, D. L. and R. N. Conner, eds., Wilderness and Natural Areas in the Eastern United States: A Management Challenge. Center for Applied Studies, School of Forestry, Stephen F. Austin University, Nacogdoches, Tex.
- Farrier, M. H. 1958. Summary of insect conditions 1957: North Carolina. U.S. Department of Agriculture Cooperative Economic Insect Report 8(13): 240–245.
- Froeschner, R. C. 1944. Contributions to a synopsis of the Hemiptera of Missouri, pt. III. Lygaeidae, Pyrrhocoridae, Piesmididae, Tingididae, Enicocephalidae, Phymatidae, Ploiaridae, Reduviidae, Nabidae. American Midland Naturalist 31: 638–683.
- Harrington, J. E. 1972. Notes on the biology of *Ischnodemus* species of America north of Mexico (Hemiptera: Lygaeidae: Blissinae). University of Connecticut Occasional Papers, Biological Science Series 2: 47–56.
- Hendrickson, G. O. 1930. Studies on the insect fauna of Iowa prairies. Iowa State College Journal of Science 4: 49–179.
- Holder, M. D. 1990. The sap-feeding insect guild of prairie cordgrass, *Spartina pectinata*. M.S. thesis, Central Missouri State University, Warrensburg. 37 pp.
- Johnson, S. R. 1995. Spider communities in the canopies of annually burned and long-term unburned *Spartina pectinata* wetlands. Environmental Entomology 24: 832–834.
- Mobberley, D. G. 1956. Taxonomy and distribution of the genus *Spartina*. Iowa State College Journal of Science 30: 471–574.
- Ottesen, C. 1989. Ornamental Grasses: The Amber Wave. McGraw-Hill Publishing Co., New York. 230 pp.
- Say, T. 1832. Description of new species of heteropterous Hemiptera of North America. New Harmony, Ind. 39 pp.
- Slater, J. A. 1976. Monocots and chinch bugs: A study of host plant relationships in the lygaeid subfamily Blissinae (Hemiptera: Lygaeidae). Biotropica 8: 143–165.
- Slater, J. A. and D. B. Wilcox. 1973. The chinch bugs or Blissinae of South Africa (Hemiptera: Lygaeidae). Memoirs of the Entomological Society of Southern Africa 12: 1–135.
- Still, S. M. 1994. Manual of Herbaceous Ornamental Plants, 4th ed. Stipes Publishing Co., Champaign, Ill. 814 pp.
- Torre-Bueno, J. R. de la. 1908. Hemiptera Heteroptera of Westchester County, N.Y. Journal of the New York Entomological Society 16: 223–238.